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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
FOX, DAVID T	

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 11/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/613,053	IMAMURA ET AL.	
	Examiner	Art Unit	
	David T. Fox	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-29,32-44 and 47-58* is/are pending in the application.

4a) Of the above claim(s) *16-20,27,33,40-44,47-51 and 55-58* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15,21-26,28,29,32,34-39 and 52-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/451,366.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/3/04 & 3/16/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

The application should be reviewed for errors. Errors appear, for example, on page 1 of the specification, the middle line of each paragraph, where all the words run into each other, and are not separated by spaces between the words. Page 1 is also objected to for the recitation of "DESCRIPTION" at the top of the page, which is redundant. Moreover, the specification should be amended on page 1 to indicate that the parent application number 10/451,366 filed April 24, 2002 is now abandoned. All specification amendments should comply with 37 CFR 1.121(b).

Further errors appear in the claims as follows:

In claim 21, line 5, "nucleotide" should be replaced with ---nucleotides---; in claim 21, line 12, where "3002the" should be replaced with ---3002th---; in claim 22, lines 1-2, "a nucleotide sequences" is incorrect; and in claims 35-36, line 2, "claim15" should be replaced with ---claim 15---. All claim amendments should comply with 37 CFR 1.121(c).---

Claim 27 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should depend upon other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits. Amendment of claim 27, line 2, to insert ---one--- after "any" would obviate this objection, and result in examination of the claim.

Claims 40-44 and 47 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 40 , line

3, recites "the transformed plant of claim as a fertility restoring line". As Claim 40 does not specify the claim on which it depends, it cannot be examined. All claims depending upon claim 40 are included in this objection.

Applicant's election with traverse of Group II and SEQ ID NO:1 encoding SEQ ID NO:3 in the reply filed on 02 August 2006 is acknowledged. The traversal is on the ground(s) that there would be no burden to search the protein per se as encoded by the elected nucleic acid of Group II, or the promoter associated with the elected coding region of Group II. Applicant further traverses that the nucleic acid sequences are highly similar based upon consensus sequences, and thus should be searched together in a single application. This is not found persuasive because proteins, coding sequences, and promoters have different uses and are biochemically distinct molecules, as stated previously. Regarding the examination of multiple nucleotide sequences, the Examiner maintains that limited resources prevent the search of multiple coding sequences. In fact, the Examiner was informed by the sequence searchers that his initial request for searching entire SEQ ID NO:1 in addition to the subsequence set forth between nucleotides 3754 and 8553 would consume over 44 hours, which was more than twice the time allotted to a single application. In response, the Examiner requested a search in which SEQ ID NO:1 was divided into five subsequences. Clearly, the Examiner was unable to request the searching of additional coding sequences, no matter how closely related to SEQ ID NO:1 or to each other. The requirement is still deemed proper and is therefore made FINAL.

Claims 15, 21-26, 28-29, 32, 34-39 and 52-54, corresponding to elected Group II, elected SEQ ID NO:1 encoding SEQ ID NO:3, and fulfilling all the requirements of 37 CFR 1.75(c), are examined in the Office action that follows. Claims 16-20, 33, 48-51 and 55-58 are withdrawn as being drawn to non-elected inventions. Claims 27, 40-44 and 47 are withdrawn as failing to comply with 37 CFR 1.75(c), as stated above.

Claim 52 is objected to for reading on non-elected subject matter, namely non-elected SEQ ID NOS: 17 and 19. Claim 54 is objected to for reading on non-elected SEQ ID NO:2.

The effective filing date of the instant invention is 25 April 2001, the filing date of the earliest foreign priority application to disclose SEQ ID NO:1. SEQ ID NO:3 was first disclosed in the foreign priority application filed 29 January 2002.

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 15, 21-23, 37, 39 and 52-54 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 15, 21-23 and 52-54 are directed to non-isolated DNA, which is indistinguishable from that occurring naturally. Claims 37 and 39 are directed to seeds of transgenic plants. Due to Mendelian segregation of the transgene, seeds produced by crossing a transgenic plant with a non-transgenic plant may not contain the transgene. Thus, said seeds would be indistinguishable from naturally occurring seeds.

See American Wood v. Fiber Disintegrating Co., 90 U.S. 566 (1974); American Fruit Growers v. Brogdex Co., 283 U.S. 2 (1931); Funk Brothers Seed Co. v. Kalo Inoculant Co., 33 U.S. 127 (1948); and Diamond v. Chakrabarty, 206 USPQ 193 (1980).

Amendment of claims 15, 21-23 and 52-54, to indicate that the DNA is ---isolated---, would obviate the rejection of those claims. Amendment of claims 37 and 39, to indicate that the seeds ---contain the plant-transforming vector---, would obviate the rejection of those claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21-23, 28-29, 32 and 34-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Dependent claims are included in all rejections.

Claims 21-22 are indefinite in their recitation of "A DNA of any of the followings" which is awkward, and which does not employ proper Markush terminology, as it implies that more than one species may be selected simultaneously. See MPEP 2173.05(h).

Claim 23 is indefinite in its recitation of "homologue thereof" as it is unclear whether this refers to the male sterile gene or to the radish variety. Furthermore, claim 23 is indefinite for failing to further limit claim 15 from which it depends. Claim 15 is drawn to DNA, while claim 23 refers to a cytoplasmic male sterile plant.

Claim 28 is unduly narrative in its recitation of "is introduced with an induction type promoter...can regulate an expression" which is confusing. Furthermore, the

relationship between the DNA of claim 15 and the "induction type" promoter is unclear. If intended, and if support exists for same, the claim should be amended to indicate that the promoter is operably linked to the DNA of claim 15.

Claims 32 and 35-38 are indefinite in their recitation of "promoter DNA...and the DNA of claim 15 [or the DNA encoding a protein involved in restoration of...fertility]", as the relationship between the promoter and the coding sequence is unclear. If intended, and if support exists for same, the claim should be amended to indicate that the promoter is operably linked to the DNA of claim 15 (or the DNA encoding a fertility restoring-protein).

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 15, 21-26, 28-29, 32, 34-39 and 52 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are broadly drawn to nucleic acids of any sequence which have multiple petatricopeptide (PPR) motifs and which encode any fertility restorer protein of any sequence from any plant, nucleic acids of any sequence which comprise a multitude of nucleotide additions, deletions or substitutions of SEQ ID NO:1 or subsequences thereof; and to plant cells and plants transformed therewith.

In contrast, the specification only provides guidance for nucleic acids comprising entire SEQ ID NO:1 from radish which encode SEQ ID NO:3, which is a restorer protein capable of restoring fertility to male-sterile Brassica or radish plants containing Ogura or Kosena cytoplasm. No guidance is provided for the characterization of a multitude of sequence variants of SEQ ID NO:1, or which are defined only based on their encoding a protein with multiple PPR motifs. As stated below, the mere presence of PPR motifs is not diagnostic for fertility restoration. Furthermore, no guidance is provided for a multitude of sequences from a multitude of plant species which encode a restorer protein, and no guidance is provided for a multitude of radish restorer proteins capable of restoring fertility to a multitude of cytoplasmic male sterile plants of unrelated plant species.

The Federal Circuit has recently clarified the application of the written description requirement. The court stated that a written description of an invention "requires a precise definition, such as by structure, formula, [or] chemical name, of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 119 F.3d 1559, 1568; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). The court also concluded that "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material." Id. Further, the court held that to adequately describe a claimed genus, Patent Owner must describe a representative number of the species of the claimed genus, and that one of skill in the art should be able to "visualize or recognize the identity of the members of the genus." Id.

Finally, the court held:

A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus. Id.

See also MPEP Section 2163, page 174 of Chapter 2100 of the August 2005 version, column 1, bottom paragraph, where it is taught that

[T]he claimed invention as a whole may not be adequately described where an invention is described solely in terms of a method of its making coupled with its function and there is no described or art-recognized correlation or relationship between the structure of the invention and its function. A biomolecule sequence described only by a functional characteristic, without any known or disclosed correlation between that function and the structure of the sequence, normally is not a sufficient identifying characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence.

See also Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ 2d 1016 at 1021, (Fed. Cir. 1991) where it is taught that a gene is not reduced to practice until the inventor can define it by "its physical or chemical properties" (e.g. a DNA sequence).

Given the claim breadth and lack of guidance as discussed above, the specification fails to provide an adequate written description of the genus of sequences as broadly claimed. Given the lack of written description of the claimed genus of sequences, any method of using them, such as transforming plant cells and plants therewith, and the resultant products including the claimed transformed plant cells and plants containing the genus of sequences, would also be inadequately described. Accordingly, one skilled in the art would not have recognized Applicant to have been in possession of the claimed invention at the time of filing. See the Written Description Requirement guidelines published in Federal Register/ Vol. 66, No. 4/ Friday January 5, 2001/ Notices: pp. 1099-1111.

Claims 15, 21-26, 28-29, 32, 34-39 and 52 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for claims limited to nucleic

acids comprising entire SEQ ID NO:1 or encoding entire SEQ ID NO:3, and to Brassica and radish plant cells and plants transformed therewith, wherein the transgenes restore male fertility to male sterile Brassica or radish plants caused by the Ogura or Kosena cytoplasms; does not reasonably provide enablement for claims broadly drawn to nucleic acids of any sequence which have multiple petatricopeptide (PPR) motifs and which encode any fertility restorer protein of any sequence from any plant, nucleic acids of any sequence which comprise a multitude of nucleotide additions, deletions or substitutions of SEQ ID NO:1 or subsequences thereof; or their use to restore fertility to non-Brassica or non-radish plants or to plants not containing the Ogura or Kosena cytoplasms; or to animal transformants. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are broadly drawn to nucleic acids of any sequence which have multiple petatricopeptide (PPR) motifs and which encode any fertility restorer protein of any sequence from any plant, nucleic acids of any sequence which comprise a multitude of nucleotide additions, deletions or substitutions of SEQ ID NO:1 or subsequences thereof; and to plant cells and plants transformed therewith. Claims 25, 28-29, and 35-36 are drawn to "transformants" of any type, encompassing bacterial cells, plant cells and plants, and animal cells and animals.

In contrast, the specification only provides guidance for nucleic acids comprising entire SEQ ID NO:1 from radish which encode SEQ ID NO:3, which is a restorer protein capable of restoring fertility to male-sterile Brassica or radish plants containing Ogura or

Kosena cytoplasm. No guidance is provided for the characterization of a multitude of sequence variants of SEQ ID NO:1, or which are defined only based on their encoding a protein with multiple PPR motifs. Furthermore, no guidance is provided for a multitude of sequences from a multitude of plant species which encode a restorer protein, and no guidance is provided for a multitude of radish restorer proteins capable of restoring fertility to a multitude of cytoplasmic male sterile plants of unrelated plant species. Moreover, the specification is completely silent with respect to animal transformation methods.

The existence or operability of fragments or variants of SEQ ID NO:1 encoding SEQ ID NO:3, or variants or fragments from a multitude of other plant species, particularly those that function as restorer genes, is unpredictable and unlikely. Brown (1999) teaches that cruciferous plants such as radish and Brassica are unique with regard to the close relationship of multiple alleles, wherein other plant species contain multiple restorer genes at different loci (see, e.g., page 351, Abstract). Moreover, Brown teaches that operable restorer genes for a particular cytoplasm are rare even within cruciferous species (see, e.g., paragraph bridging pages 355 and 356).

Moreover, the mere presence of pentatricopeptide motifs in a protein is not diagnostic for male fertility restoration, so that it is unpredictable and unlikely that a multitude of non-exemplified sequences which merely contain multiple PPR motifs would act as restorer proteins. Small et al (2000, Applicant submitted) teach that the PPR motif is present in a multitude of chloroplast proteins (which are not involved in male sterility or fertility restoration, as are some mitochondrial proteins), and that one-

third of all proteins which contain PPR motifs are not involved in targeting to any plant cell organelle (see, e.g., page 46, column 1; page 47, Table 1 and column 2). Similarly, Lahmy et al (2000, FEBS Letters) teach that a protein containing multiple PPR motifs is a chloroplast protein (see, e.g., page 255, Abstract; page 256, Figure 1; page 260, column 1, first full paragraph). See also Akagi et al (2004, Theoretical and Applied Genetics), who teach that the presence of multiple PPR motifs in a multitude of mitochondrial proteins was not correlated with fertility restoration (see, e.g., page 1449, Abstract).

Furthermore, Iwabuchi et al (US Patent 5,866,782) teach that tobacco transformation with a radish-derived nucleic acid involved in male sterility caused morphological abnormalities in vegetative tissue, rather than the predicted alteration of floral morphology (see, e.g., column 8, line 47 through column 9, line 39; column 11, line 39 through column 13, line 21). Thus, it does not appear that the exemplified radish/Brassica restorer system would be widely applicable or operable in other plant species. In addition, Koizuka et al (2000, Theoretical and Applied Genetics, Applicant submitted) teach that restoration of fertility in plants containing the Kosena cytoplasm requires two restorer genes (see, e.g., page 949, Abstract). Thus, plant transformation with a single restorer gene would not be sufficient to restore fertility.

In addition, plant transformation with genes conferring male sterility or restoring male fertility is unpredictable. Singh et al (Genetics 143: 505-516, May 1996) teach that a single male fertility restorer gene influences three other unrelated mitochondrial genes (see, e.g., page 506, column 1, first full paragraph, last two sentences), which could

have other deleterious affects on plant viability or morphology. Araya et al (1993) teach that plant transformation with mitochondrial genes intended to restore fertility actually gave inconsistent results (see, e.g., page 89, Figure 4; page 90, first full paragraph and Table 1). WO 98/54340 (McGILL UNIVERSITY) teaches that plant transformation with putative fertility restorer genes gave inconsistent results, and also deleteriously affected overall plant regeneration, morphology and seed set (see, e.g., page 12, lines 11-37; page 13, lines 1-8; page 15, Table 2, last row; page 19, lines 1-12; page 20, line 29 through page 21, line 2).

Schnable et al (May 1998, Applicant cited) further emphasizes the unpredictability inherent in fertility restoration and plant transformation therefor. Schnable et al teach that sterility and restorer genes may be difficult to identify and clone, that many systems require multiple unlinked restorer genes, that sterility and restorer genes may be linked to deleterious genetic material conferring unwanted traits such as disease susceptibility, that cytoplasmic male sterility genes fail to confer sterility in unrelated or even related plant species following transformation therewith, and that even within a single species there exists cultivar-specific sterility induction (see, e.g., page 177, column 1, first full paragraph; page 178, paragraph bridging the columns, and the second and fourth full paragraphs of column 2; page 179, paragraph bridging the columns).

Finally, animal transformation is unpredictable and is hampered by a dearth of transformable and regenerable cells, unpredictable decrease in endogenous gene

expression, animal mortality and morphological abnormality (see, e.g., McCreath et al, page 1066, Abstract; page 1067, column 2, third, fifth and sixth paragraphs).

Given the unpredictability, claim breadth, and lack of guidance as discussed above, undue experimentation would have been required by one skilled in the art to identify and evaluate a multitude of non-exemplified sequence variants or fragments from a multitude of plant species for their ability to confer fertility restoration, in either the exemplified Brassica or radish plants containing Ogura or Kosena cytoplasm, or in a multitude of unrelated plants containing a multitude of cytoplasmic means of male sterility. Undue experimentation would have also been required to develop and obtain reliable means of animal transformation.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15, 21-22, 24-25, 28, 35-37 and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Cui et al (1996 Science, Applicant submitted).

Claim 15 is drawn to any DNA encoding a protein comprising a multitude of 35 amino acid-long units of unspecified sequence, wherein the protein is involved in fertility restoration. Claims 24-25, 28, and 35-37 are drawn to vectors comprising said DNA,

and transformants comprising said vectors. Claim 28 is drawn to any transformant comprising "partial or full-length" sequences of the above-mentioned DNA molecules and additionally comprising "induction-type" promoters. Claim 52 specifies that the encoded protein comprise "an" amino acid sequence of SEQ ID NO:3 which is interpreted to include a single amino acid residue.

Claims 21-22 are drawn to DNA comprising "a" sequence of SEQ ID NO:1 wherein "a" is interpreted to be a single nucleotide (part 1 of claims 21-22); DNA comprising a plurality of deletions, additions, or substitutions to SEQ ID NO:1 wherein none of the original sequence may be retained (part 2 of claims 21-22); or DNA comprising any sequence which hybridizes to SEQ ID NO:1 under "a stringent condition" which includes conditions of low stringency (part 3 of claims 21-22); wherein said DNA molecules encode proteins involved in restoration of male fertility to cytoplasmically male sterile plants.

Cui et al teach isolated DNA molecules encoding fertility restorer proteins, said DNA molecules comprised in plasmid vectors which are inherently comprised in bacterial transformants, said bacterial transformants inherently comprising "induction-type" promoters inducible by heat, carbohydrates, alcohol, etc (see, e.g., page 1334, Abstract and column 3; page 1335, columns 1 and 2 and Figure 4). These DNA molecules inherently contain single nucleotides of SEQ ID NO:1, or would hybridize thereto under conditions of low stringency. Furthermore, these DNA molecules would encode proteins which would inherently comprise a single amino acid of SEQ ID NO:3,

and would inherently comprise a multitude of 35 amino acid-long units of unspecified sequence.

Claims 15, 21-26, 28-29, 32, 34-39 and 52 are rejected under 35 U.S.C. 102(e) as being anticipated by Brown (US Patent 6,365,798 effectively filed 23 November 1999).

Claims 26, 28-29, 32, and 34-39 are drawn to plant transformation vectors comprising DNA molecules encoding fertility restorer proteins, said DNA molecules comprised in plant transformation vectors and operably linked to promoters which induce expression at least in anther tissue; plants transformed therewith including Brassica plants, and seeds produced therefrom; wherein the sterility to be restored is caused by an Ogura or Kosena cytoplasm or a homologue thereof.

Brown teaches a plant transformation vector comprising an anther-expressible AP3 promoter and an edited A9-A6 gene encoding a mitochondrial fertility restoration protein, wherein Brassica plants containing Polima male sterility cytoplasm were rendered fertile (see, e.g., Figures 2I-2J and 4; column 2, lines 6-54; column 3, line 52 through column 4, line 7; column 4, line 66 through column 5, line 16; column 6, line 46 through column 7, line 16; Tables 1 and 2; column 10, lines 13-30; column 11, lines 46-60). Given the same organellar source and function of the protein taught by Brown, it would inherently contain multiple PPR motifs.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15, 21-26, 28-29, 32, 34-39, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/49831 (McGill University 1997), in view of Moloney et al. (US 5,750,871), further in view of Delourme et al (1998).

The claims are drawn to DNA molecules comprising a radish restorer gene encoding a protein with pentatricopeptide motifs, wherein said protein may comprise a single amino acid sequence of SEQ ID NO:3, or wherein said gene may comprise a single nucleotide of SEQ ID NO:1 or hybridize thereto under conditions of low stringency, and vectors comprising said DNA molecules; and a method of transforming a Brassica napus plant with a fertility restorer gene including a radish restorer gene operably linked to a promoter inducing expression in at least anther cells, wherein the transformants may be identified by observing male fertility, wherein fertility may be demonstrated by seed set following the pollination of plants containing Ogura or Kosena

male sterile cytoplasm (or homologues thereof) with functional pollen from the transformant, for maintaining the male-sterile line.

McGill University (1997) teaches the isolation of a fertility restorer gene from Brassica, and suggests Brassica transformation therewith via the methods of Moloney et al, wherein said plants containing said restorer gene operably linked to a promoter effecting expression in at least anther cells are able to provide functional pollen for seed set, and wherein plants containing restorer genes and male sterile cytoplasm are generally propagated by self-pollination (see, e.g., Figure 1; pages 4-7 and 10). McGill University (1997) also suggest the use of restorer genes from other species (see, e.g., page 11, lines 3-7).

McGill University (1997) does not teach a restorer gene from radish or the maintenance of male-sterile plants comprising the Kosena or Ogura cytoplasms, or "homologues" thereof.

Moloney et al teach Brassica napus transformation via Agrobacterium, and suggest the use of transgenes conferring a variety of agronomic traits including regulation of male fertility, wherein said transgenes are operably linked to T-DNA border sequences (see, e.g., column 5, lines 21-47, especially line 41; column 14, line 58 through column 18, line 28).

Delourme et al teach the localization of the radish Rfo restorer gene, and suggest its cloning via map-based techniques (see, e.g., page 129, Abstract and paragraph bridging the columns; page 132, column 2, middle paragraph; page 133, column 2, bottom paragraph, last sentence).

It would have been obvious to one of ordinary skill in the art to transform Brassica plants containing male-sterile cytoplasm with cruciferous restorer genes as taught by McGill University, using the technique taught by Moloney et al, as suggested by Moloney et al. It would have been further obvious to self-pollinate the transformants containing male-sterile cytoplasm for ease of propagation of the desirable genotype containing the restorer gene, as suggested by McGill University. Choice of cruciferous restorer gene, whether from Brassica as taught by McGill University or from radish as taught by Delourme et al and suggested by McGill University, would have been the optimization of process parameters.

Claims 53-54 are deemed free of the prior art, given the failure of the prior art to teach or reasonably suggest isolated nucleic acid molecules comprising entire SEQ ID NO:1 or encoding entire SEQ ID NO:3.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David T. Fox whose telephone number is 571-272-0795. The examiner can normally be reached on Monday through Friday from 10:30AM to 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg, can be reached on 571-272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

October 30, 2006

DAVID T. FOX
PRIMARY EXAMINER
GROUP ~~180~~ 1638